

See Project 758

For all other Docs

Including Cent. 'C-LSH08'-157/D.

See AE 758-4

DCLs

ICA.

Apine.

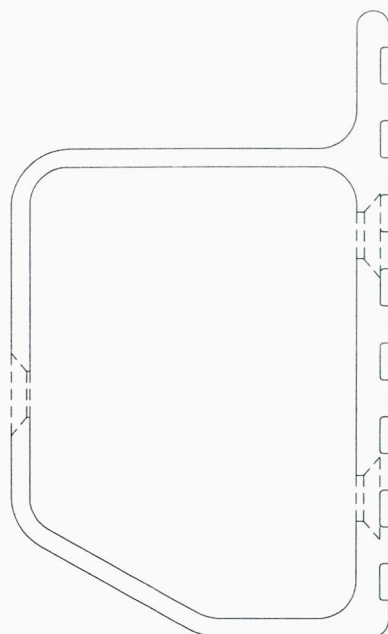
Pibt/AME.

Mike Lequesne.

(h) 403.609.7964

(c) 403.815.5968

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL RELEASE		07/05/08



DRILL "F"
100° COUNTERSINK
TYP

1.425

0.569

0.756

0.50

44.50

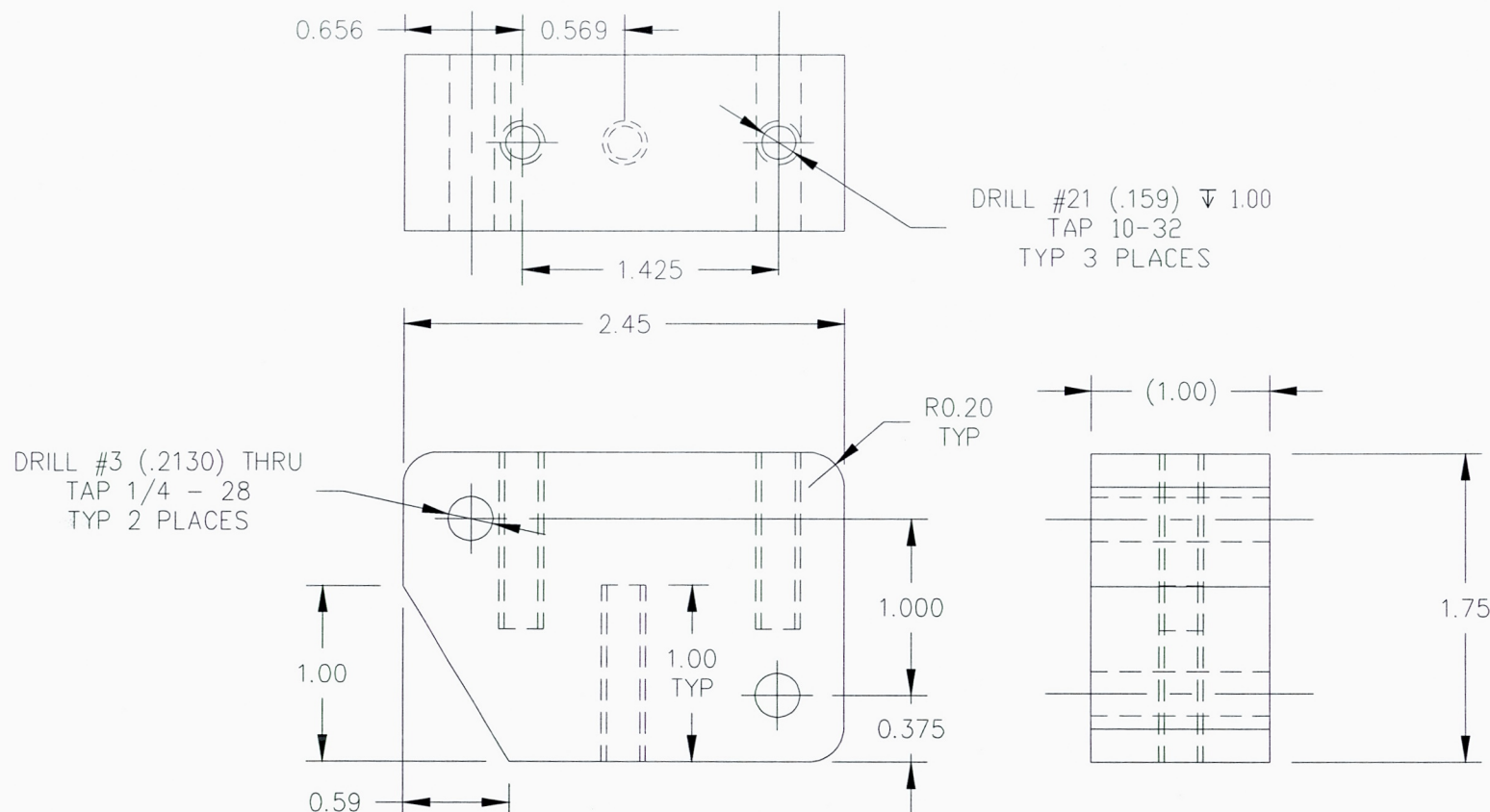
NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
2. DEGREASE, ALODINE AND PRIME PRIOR TO ASSEMBLY.

1	79832-01	01	STEP	78230 STEP EXTRUSION
01	PART NO.	ITEM	DESCRIPTION	MATERIAL
QTY	LIST OF MATERIALS			
<p>THIS DRAWING CONTAINS INFORMATION AND DATA WHICH IS PROPRIETARY TO AERO DESIGN LTD. THIS DRAWING, OR ANY PORTION THEREOF, MAY NOT BE REPRODUCED, COPIED, OR DUPLICATED IN ANY MANNER, NOR USED FOR MANUFACTURING WITHOUT THE WRITTEN CONSENT OF AERO DESIGN LTD. BY ACCEPTING THIS DRAWING FOR REFERENCE, THE RECIPIENT AGREES TO HOLD AERO DESIGN LTD. HARMLESS FROM THE USE, OR MISUSE, OF THIS DRAWING OR THE INFORMATION CONTAINED THEREON.</p>				<p>APPROVALS</p> <p>DRAWN: R. RATHWELL</p> <p>CHECKED: E. BURGOIN</p> <p>DATE: 07/05/08</p>
<p>UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:</p> <p>DECIMALS ANGLES</p> <p>X.XXX ±0.010 ±1/2°</p> <p>X.XX ±0.03</p> <p>X.X ±0.1</p>				<p>AERO DESIGN LTD.</p> <p>CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8027 fax: (403) 250-8333 www.aerodesign.ca</p>
<p>BELL 212/412/205A-1/205B RAPPEL STEP STEP</p>				<p>SCALE 1 : 1</p> <p>DWG. SIZE A4</p> <p>DWG. NO. 79830</p> <p>REV. 0</p>
SHEET 1 OF 1				

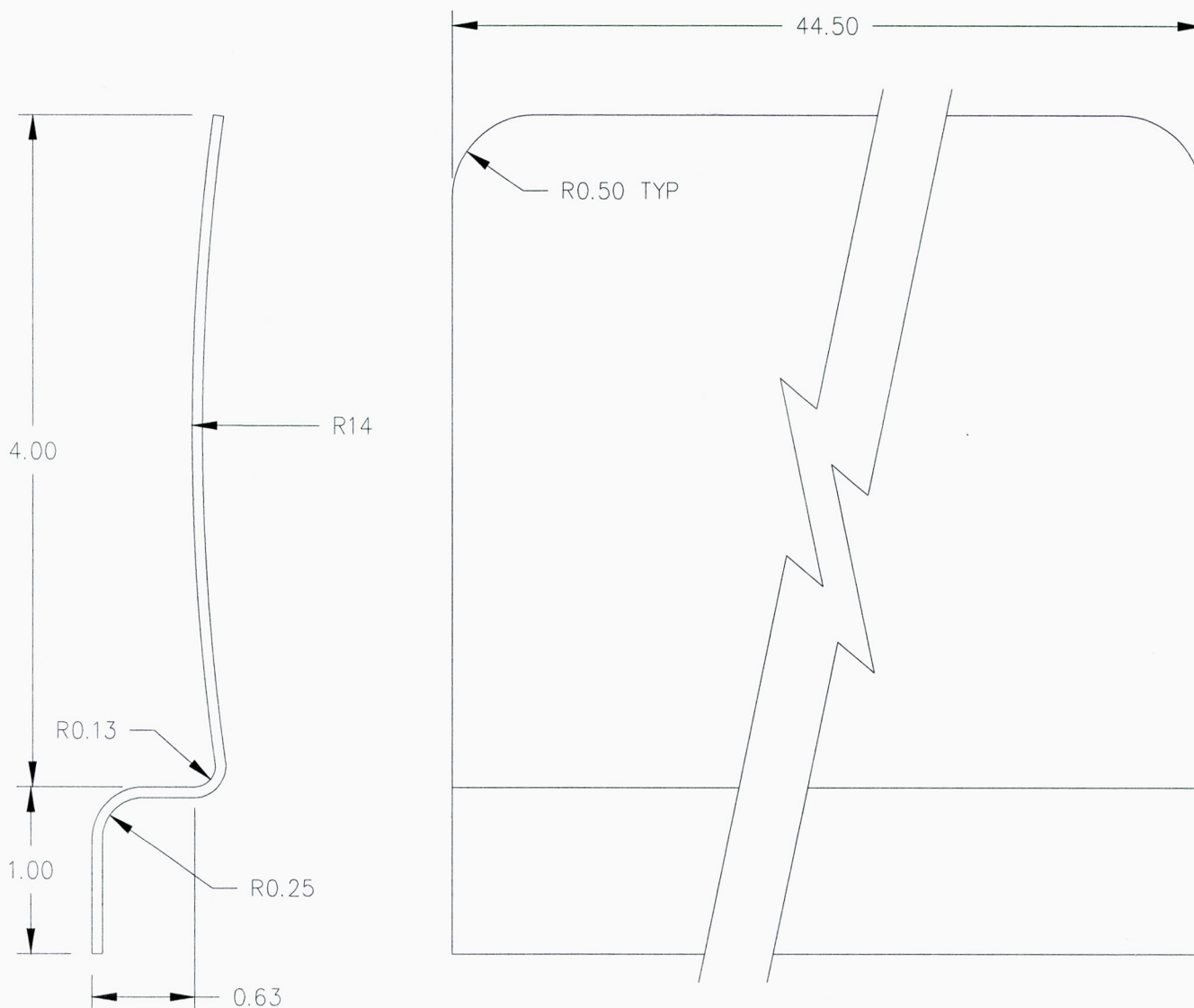
REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	*	*	*

- NOTES
1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
 2. DECREASE AND ALODINE PRIOR TO ASSEMBLY.



1	79833-01	01	BLOCK	6061-T651 ALUM PLATE	AMS-QQ-A-250/11	T=1.0
01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
QTY	LIST OF MATERIALS					
THIS DRAWING CONTAINS INFORMATION AND DATA WHICH IS PROPRIETARY TO AERO DESIGN LTD. THIS DRAWING, OR ANY PORTION THEREOF, MAY NOT BE REPRODUCED, COPIED, OR DUPLICATED IN ANY MANNER, NOR USED FOR MANUFACTURING WITHOUT THE WRITTEN CONSENT OF AERO DESIGN LTD. BY ACCEPTING THIS DRAWING FOR REFERENCE, THE RECIPIENT AGREES TO HOLD AERO DESIGN LTD. HARMLESS FROM THE USE, OR MISUSE, OF THIS DRAWING OR THE INFORMATION CONTAINED THEREON.	APPROVALS		DATE	AERO DESIGN LTD. CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8027 fax: (403) 250-8333 www.aerodesign.ca		
	DRAWN: R. RATHWELL		07/05/08			
	CHECKED: E. BURGOIN					
	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1			BELL 212/412/205A-1/205B RAPPEL STEP BLOCK		
				SCALE 1 : 1	DWG. SIZE	DWG. NO.
			SHEET 1 OF 1	A4	79833	0

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		



NOTES

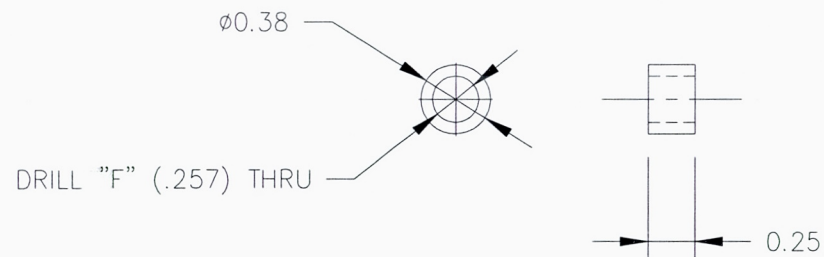
1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
2. DEGREASE, ALODINE AND PRIME PRIOR TO ASSEMBLY.

1	79834-01	01	KICK PLATE	ALUM SHEET		.063 THICK
QTY	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE

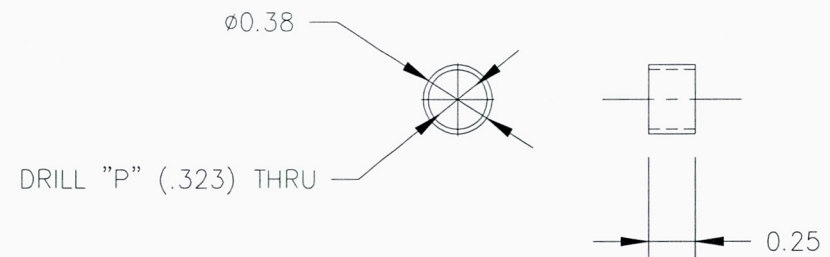
LIST OF MATERIALS

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	DRAWN: R. RATHWELL		07/05/08			
	CHECKED: E. BURGOIN					
	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1			BELL 212/412/205A-1/205B RAPPEL STEP KICK PLATE		
	SCALE 1 : 1		DWG. SIZE	DWG. NO.	REV.	
SHEET 1 OF 1		A4	79834	0		

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		



(01) BUSHING



(02) BUSHING

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.

1	79835-02	02	BUSHING	304 STAINLESS ROD	ASTM-A276	3/8 DIA
1	79835-01	01	BUSHING	304 STAINLESS ROD	ASTM-A276	3/8 DIA
01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
QTY	LIST OF MATERIALS					
NOTICE THIS DRAWING CONTAINS INFORMATION AND DATA WHICH IS PROPRIETARY TO AERO DESIGN LTD. THIS DRAWING, OR ANY PORTION THEREOF, MAY NOT BE REPRODUCED, COPIED, OR DUPLICATED IN ANY MANNER, NOR USED FOR MANUFACTURING WITHOUT THE WRITTEN CONSENT OF AERO DESIGN LTD. BY ACCEPTING THIS DRAWING FOR REFERENCE, THE RECIPIENT AGREES TO HOLD AERO DESIGN LTD. HARMLESS FROM THE USE, OR MISUSE, OF THIS DRAWING OR THE INFORMATION CONTAINED THEREON.			APPROVALS	DATE	AERO DESIGN LTD. CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8027 fax: (403) 250-8333 www.aerodesign.ca	
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			CHECKED: E. BURGOIN			
			UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1		BELL 212/412/205A-1/205B RAPPEL STEP BUSHING	
			SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.
			SHEET 1 OF 1	A4	79835	0

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

CP798

APPLICANT: AERO Design Ltd.
2013 - 39th Ave N.E.
Calgary, Alberta
T2E 6R7

CORRESPONDANCE TO: AERO Design Ltd.
(If other than applicant) 2013 - 39th Ave N.E.
Calgary, Alberta
T2E 6R7

DATE: 07 May, 2008
REV. No. 0

MAKE: Bell Helicopter
MODEL: 212, 412, 205A-1, 205B

REGISTRATION:
SERIAL No.:

NATURE OF WORK: Rappel Step installed on Helicopter Hardpoints

MODEL CERTIFICATION BASIS: FAR 29, at amendment 29-2
MODIFICATION CERTIFICATION BASIS: FAR 29, at amendment 29-2

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Subpart B	Flight				
29.29	Empty Weight & Corresponding CG	Installation Drawing			
29.45 –	Performance	N/A - Not Significant			Position and size of this installation will not significantly alter the performance and flight characteristics of the type approved aircraft.
29.79					
29.141 –	Flight Characteristics	N/A - Not Significant			
29.241					
29.251	Vibration	Flight Test		X	TP798.02 Flight
Subpart C	Structure				
29.301	Loads - Personnel	Engineering Report		X	Design loads appropriate to function are used.
29.301	Loads – Air	N/A			The step has a small surface area.
29.303	Factor of Safety	Engineering Report		X	
29.305	Strength and Deformation	Engineering Report		X	
29.307	Proof of Structure	Engineering Report		X	Rappeler is attached to a belay line, which supports the majority of his weight. Helicopter is normally in a hover at this time. The step is an aid to stepping down to the landing gear tube.
29.337	Manouvering Load Factor	N/A			
Subpart D	Design & Construction				
29.601	Design	N/A			There are no unusual features on this installation.
29.603	Materials	Engineering Report		X	
29.605	Fabrication Methods	Fabrication Drawing		X	

AIRWORTHINESS REQUIREMENTS
COMPLIANCE PROGRAM

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
29.609	Protection of Structure	Fabrication Drawing		X	
29.613	Material Strength Properties & Design Values	Fabrication Drawing		X	

AERO Design Ltd.

LSH08-1571D

Signed

FLIGHT TEST PLAN

TP 757.02

Rappel Step

Bell 212, 412, 205A-1, 205B

Revision 0
13 May 2008

AERO Design Ltd.
Engineering Consultants

2013 – 39th Avenue N.E., Calgary, Alberta T2E 6R7
Phone: (403) 250-8027
Fax: (403) 250-8333
E-Mail: info@aerodesign.ca

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1.0 INTRODUCTION

This document tests the installation of the AERO Design rappel step onto an Apline Helicopters Bell 212.

2.0 REFERENCE

Aero Design Ltd. Drawing 79801, Rappel Step Installation
Bell 212 Rotorcraft Flight Manual, BHT-212VFR-FM-1 (Current Revision)

3.0 BASIS OF CERTIFICATION

Bell 412: FAR Part 29 dated 1 February 1965, Amendment 29-1 and 29-2

Bell 212: FAR Part 29 dated 1 February 1965, Amendment 29-1 and 29-2

Bell 205A-1: CAR 7 dated August 1, 1956, Amendments 7-1 through 7-4

Bell 205B: CAR 7 dated August 1, 1956, Amendments 7-1 through 7-4

This installation

Part 29 dated 1 February 1965, Amendment 29-1 and 29-2

This flight test programme will demonstrate that this installation complies with the flight requirements of the original basis of certification.

4.0 FLIGHT TEST PREPARATION

4.1 General

The flight crew should review and be familiar with the regulatory requirements of FAR29.251 *Vibration*, prior to conducting flight tests. These requirements are included as Appendix C.

The flight crew should examine and be familiar with the modification installed including a review of the proposed Flight Manual Supplement (if any).

The flight crew should always be attentive to unusual noises, vibrations, control characteristics, attitudes and instrument indications.

Altitude: The flight test shall be conducted below 1000 feet above sea level.

4.2 Configuration

Modification flight test

Rappel Step to be installed in accordance with AERO Design Ltd. Drawing 79801, Rappel Step Installation.

Those components of the modification which alter the external profile of the aircraft shall be installed in accordance with the applicable installation drawings.

Any other unusual or particularly large external modifications should be removed if practical and all external modifications installed during flight testing should be noted in the flight test report.

Weight: The gross weight of the aircraft shall be less than 7500lbs for this test.

4.3 Flight Authority

The Certificate of Airworthiness may not be valid after the modification has been installed. Flight Authority in the form of a flight permit may be required.

Flight authority to exceed the published V_{ne} of the helicopter is required. When the V_{ne} for the modification as provided in the proposed Flight Manual Supplement does not restrict the maximum speed to less than 90% of the basic helicopter V_{ne} then, the flight permit should specifically state that a higher V_{ne} is authorized.

5.0 FLIGHT TEST PROCEDURE

5.1 Vibration

FAR29.251

Low Speed (below 80 knots)

From a hover, increase forward air speed to 80 knots in level flight.

Record: Observe and record any indications of flutter or vibrations.

Forward 90 knots

From 80 knots, increase forward air speed to 90 knots in level flight.

Record: Observe and record any indications of flutter or vibrations.

Forward 100 knots

From 90 knots, increase forward air speed to 100 knots in level flight.

Record: Observe and record any indications of flutter or vibrations.

Forward 110 knots

From 100 knots, increase forward air speed to 110 knots in level flight.

Record: Observe and record any indications of flutter or vibrations.

Forward 120 knots

From 110 knots, increase forward air speed to 120 knots in level flight.

Record: Observe and record any indications of flutter or vibrations.

Forward 130 knots (Vne)

From 120 knots, increase forward air speed to 130 knots in level flight.

Record: Observe and record any indications of flutter or vibrations.

Forward 144 knots (Vd)

From 130 knots, increase forward air speed to 144 knots in level flight.

Record: Observe and record any indications of flutter or vibrations.

APPENDIX A

FLIGHT TEST REPORT

BELL 212

Aircraft: C-FALK
Serial no. 30982

Date: 14 May 2008
Location: YYC and surrounding area

Configuration: _____
No other external modifications installed on the aircraft.

Crew: Pilot: Mike Lequesne
DAR: Ted Burgoin, Aero Design Ltd.

Flutter and Vibration

TEST	ACCEPTABLE	UNACCEPTABLE	COMMENTS:
LOW SPEED (BELOW 80 KNOTS)	yes		
FORWARD 90 KNOTS	yes		
FORWARD 100 KNOTS	yes		
FORWARD 110 KNOTS	yes		
FORWARD 120 KNOTS	yes		
FORWARD 130 KNOTS (Vne)	yes		
FORWARD 144 KNOTS (Vd)	yes.		

General Notes:

Pilot:

Witness:

 01324520

M. Lequesne

Date: 14 MAY 08

E. Burgoin

Date: 

APPENDIX B

WEIGHT CALCULATIONS

Weight for Flight Test
Rappel Step Installation

Date: _____

Bell 212

C- FALK , Serial No. 30982

Item	Weight (lbs.)	
Basic Helicopter	6533.5 lb	CG 143.85 long, 0.19 Lat
Rappel Step Installation	<u>6534</u>	143.94 10.28
Pilot	<u>200</u>	
Passenger	<u>200 + 100</u>	
Fuel	<u>800/15</u>	
Total Weight	_____	

Gross Weight Limit: _____ lb.

Helicopter refueled between flights to specified fuel condition.

APPENDIX C**FAR 29 REQUIREMENTS****Federal Aviation Regulation****▼Sec. 29.251**

Part 29 AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY ROTORCRAFT	
Subpart B--Flight	Miscellaneous Flight Requirements

Sec. 29.251

Vibration.

Each part of the rotorcraft must be free from excessive vibration under each appropriate speed and power condition



Transport
Canada
Aviation

Transports
Canada
Aviation

Transport Canada Centre
800 - 1601 Airport Road NE
Calgary, Alberta
T2E 6Z8

RACH 5008-FALK
Tel: (403) 292-5019
Fax: (403) 292-6709

Alpine Helicopters Ltd.
1295 Industrial Rd
Kelowna, BC, Canada
V1Z 1G4

2008-05-14

THIS CONSTITUTES A FLIGHT PERMIT (SPECIFIC PURPOSE) FOR AIRCRAFT:

NATIONALITY AND REGISTRATION MARKS MARQUES DE NATIONALITÉ ET D'IMMATRICULATION	MANUFACTURER AND MODEL CONSTRUCTEUR ET MODÈLE	SERIAL NUMBER NUMÉRO DE SÉRIE
C-FALK	Bell 212	30982

THIS FLIGHT PERMIT IS SUBJECT TO THE FOLLOWING OPERATING LIMITATIONS:

1. Valid for **30 days** from the date of issue or the completion of intended flight(s);
2. Local VFR test flights in accordance with Aero Design Ltd. Flight Test Plan TP 798.02 from Calgary International Airport (YYC), Calgary, AB Canada, with technical landings as required, for the purpose of showing compliance with airworthiness standards for the installation of a Rappel Step;
3. Essential flight crew members only - No Passengers;
4. No flights over built-up areas;
5. The aircraft shall be certified as safe and fit for the proposed flight by a qualified Aircraft Maintenance Engineer (AME) or other such authorized person, in the aircraft journey log book prior to the commencement of the flight;
6. Commercial use prohibited;
7. Ensure that all applicable airworthiness directives have been complied with;
8. Ensure that no airworthiness limitations are exceeded;
9. Permission of the foreign aviation authority required prior to flight in their airspace;
10. This document shall be carried on board the aircraft.

DATE: 2008-05-14

SIGNATURE: [Inspector] Mel Turgeon

For the Minister of Transport - Pour le ministre des Transports

Canada

AERO DESIGN LTD.

2013 – 39th Ave N. E., Calgary, Alberta, T2E 6R7

aerodesign@telusplanet.net

F A X C O V E R S H E E T

DATE: May 14, 2008

TIME: 9:02 AM

TO: **Melvin Turgeon**

PHONE: (403) 292-5019

Transport Canada – Calgary Office

FAX: (403) 292-6709

FROM: **Richard Rathwell**

PHONE: (403) 250-8027

Aero Design Ltd.

FAX: (403) 250-8333

Number of pages including cover sheet: 2

RE: APPLICATION FOR A FLIGHT PERMIT

Melvin,

Attached is an application for a flight permit. The purpose for the flight is for the purpose of showing compliance with airworthiness standards for the installation of a rappel step on a Bell Medium (212, 412, 205A-1, 205B).

Due to contract requirements with our client, we require to conduct this flight test today.

Please call me if you have any questions.



Richard Rathwell

Print / Imprimez

Transport
CanadaTransports
CanadaAPPLICATION FOR A
FLIGHT PERMITDEMANDE DE
PERMIS DE VOL

INSTRUCTIONS

Print or type all entries. Reference *Canadian Aviation Regulations Standard 507* for the use and disposition of the form.

Dactylographier ou écrire en lettres moulées. Consultez Règlement de l'aviation canadien norme 507 du Manuel de navigabilité qui précise la façon de remplir et d'acheminer le présent formulaire.

A. AIRCRAFT IDENTIFICATION - IDENTIFICATION DE L'AÉRONEF

1. Owner - Propriétaire ALPINE HELICOPTERS LTD	3. Aircraft Manufacturer - Constructeur de l'aéronef BELL	4a. Model - Modèle 212
2. Address - Adresse 1295 Industrial Rd Kelowna, British Columbia Canada, V1Z 1G4	4b. Maximum Permissible Take-Off Weight Masse maximale admissible au décollage 5,080 Kg 11,200 lb	6. Nationality and Registration Marks Marques de nationalité et d'immatriculation C-FALK
	5. Serial Number - Numéro de série 30982	

B. PURPOSE OF FLIGHT PERMIT (Check applicable boxes) - OBJECTIF DU PERMIS DE VOL (Cocher la ou les case(s) voulu(s))

1. ☐ Ferry flights to a base for repairs or maintenance
Un vol de convoyage vers une base en vue de réparation ou de maintenance
2. ☐ Delivery, demonstration, market survey, or crew training flights
Un vol de livraison, de démonstration, d'étude de marché ou d'entraînement d'équipage
3. ☒ Flights for the purpose of showing compliance with airworthiness standards
Un vol de démonstration de conformité aux normes de navigabilité
4. ☐ Other purpose (Specify)
Autre fin (Préciser)

C. FLIGHT DESCRIPTION AND AIRCRAFT LIMITATIONS

Description of Flight(s) Use attachment when appropriate

DESCRIPTION DU VOL ET LIMITATIONS DE L'AÉRONEF

Description du ou des vol(s) Joindre une feuille au besoin

1. From - Aéroport de départ YYC - CALGARY, ALBERTA	2. To - Aéroport de destination YYC - CALGARY, ALBERTA
3. Via - Escales NIL	4. Effective date (yyyy - mm - dd) Date effective (aaaa - mm - jj) 2008-05-14
	5. Termination date (aaaa - mm - dd) Date limite (aaaa - mm - jj) 2008-08-14

6. Aircraft does not meet the applicable airworthiness requirements as follows:

Raisons pour lesquelles l'aéronef ne satisfait pas aux exigences de navigabilité en vigueur :

**RAPPEL STEP INSTALLATION IN ACCORDANCE WITH AERO DESIGN LTD. INSTALLATION DRAWING 79801.
FLIGHT TO Vd (Vne X 1.1 = 144 KNOTS) TO BE APPROVED, IN ACCORDANCE WITH AERO DESIGN LTD.
FLIGHT TEST PLAN TP798.02.**

7. The following maintenance conditions are considered necessary for safe operation:

Les conditions d'entretien suivantes sont nécessaires pour la conduite des vols en toute sécurité :

LOG BOOK ENTRY BY QUALIFIED AME

8. The following operating conditions are considered necessary for safe operation:

Les conditions d'exploitation suivantes sont nécessaires pour la conduite des vols en toute sécurité :

NO FLIGHT OVER BUILT-UP AREAS; VFR CONDITIONS; ESSENTIAL CREW ONLY; FLIGHT TO Vd (Vne X 1.1 = 144 KNOTS), IN ACCORDANCE WITH AERO DESIGN LTD. FLIGHT TEST PLAN TP798.02.

D. SIGNATURES

I hereby certify that the aircraft described above is in a condition for safe operation.
Je, soussigné, certifie que l'aéronef décrit ci-dessus est en bon état de vol.

Signature, AME Licence No., ACA No. or RCA No.
Signature, N° de licence de TEA, N° d'autorisation ou N° d'autorisation restreinte
and - et

Signature of the Registered Owner or Authorized Representative
Signature du propriétaire enregistré ou du représentant autorisé

Date (yyyy - mm - dd)
Date (aaaa - mm - jj)

2008 May 13

Date (yyyy - mm - dd)
Date (aaaa - mm - jj)

AERO DESIGN LTD.

2013 – 39th Ave N. E., Calgary, Alberta, T2E 6R7

aerodesign@telusplanet.net

F A X C O V E R S H E E T

DATE: May 14, 2008

TIME: 8:20 AM

TO: **David McNab**

PHONE: (403) 292-5008

Transport Canada – Calgary Office

FAX: (403) 292-6709

FROM: **Richard Rathwell**

PHONE: (403) 250-8027

Aero Design Ltd.

FAX: (403) 250-8333

Number of pages including cover sheet: 2

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Due to contract requirements with our client, we require to conduct this flight test today.

Please call me if you have any questions.

Richard Rathwell



Transport Canada Transports Canada

APPLICATION FOR A FLIGHT PERMIT

DEMANDE DE PERMIS DE VOL

INSTRUCTIONS

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Dactylographier ou écrire en lettres moulées. Consultez Règlement de l'aviation canadien norme 507 du Manuel de navigabilité qui précise la façon de remplir et d'achever le présent formulaire.

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	5. Serial Number - Numéro de série 30982	6. Nationality and Registration Marks Marques de nationalité et d'immatriculation C-FALK
B. PURPOSE OF FLIGHT PERMIT (Check applicable boxes) - OBJECTIF DU PERMIS DE VOL (Cocher la ou les case(s) voulue(s))		
<p>1. <input type="checkbox"/> Ferry flights to a base for repairs or maintenance Un vol de convoyage vers une base en vue de réparation ou de maintenance</p> <p>2. <input type="checkbox"/> Delivery, demonstration, market survey, or crew training flights Un vol de livraison, de démonstration, d'étude de marché ou d'entraînement d'équipage</p> <p>3. <input checked="" type="checkbox"/> Flights for the purpose of showing compliance with airworthiness standards Un vol de démonstration de conformité aux normes de navigabilité</p> <p>4. <input type="checkbox"/> Other purpose (Specify) Autre fin (Préciser)</p>		
C. FLIGHT DESCRIPTION AND AIRCRAFT LIMITATIONS		
Description of Flight(s) Use attachment when appropriate		
1. From - Aéroport de départ YYC - CALGARY, ALBERTA	2. To - Aéroport de destination YYC - CALGARY, ALBERTA	
3. Via - Escales NIL	4. Effective date (yyyy - mm - dd) Date effective (aaaa - mm - jj) 2008-05-14	5. Termination date (aaaa - mm - dd) Date limite (aaaa - mm - jj) 2008-08-14
<p>6. Aircraft does not meet the applicable airworthiness requirements as follows: Raisons pour lesquelles l'aéronef ne satisfait pas aux exigences de navigabilité en vigueur :</p> <p>RAPPEL STEP INSTALLATION IN ACCORDANCE WITH AERO DESIGN LTD. INSTALLATION DRAWING 79801. FLIGHT TO Vd (Vne X 1.1 = 144 KNOTS) TO BE APPROVED, IN ACCORDANCE WITH AERO DESIGN LTD. FLIGHT TEST PLAN TP798.02.</p>		
<p>7. The following maintenance conditions are considered necessary for safe operation: Les conditions d'entretien suivantes sont nécessaires pour la conduite des vols en toute sécurité :</p> <p>LOG BOOK ENTRY BY QUALIFIED AME</p>		
<p>8. The following operating conditions are considered necessary for safe operation: Les conditions d'exploitation suivantes sont nécessaires pour la conduite des vols en toute sécurité :</p> <p>NO FLIGHT OVER BUILT-UP AREAS; VFR CONDITIONS; ESSENTIAL CREW ONLY; FLIGHT TO Vd (Vne X 1.1 = 144 KNOTS), IN ACCORDANCE WITH AERO DESIGN LTD. FLIGHT TEST PLAN TP798.02.</p>		
D. SIGNATURES		
<p>I hereby certify that the aircraft described above is in a condition for safe operation. Je, soussigné, certifie que l'aéronef décrit ci-dessus est en bon état de vol.</p>		
<p><i>[Signature]</i> Signature, AME Licence No., ACA No. or RCA No. Signature, N° de licence de TEA, N° d'autorisation ou N° d'autorisation restreinte and - et</p>		<p>2008 MAY 13 Date (yyyy - mm - dd) Date (aaaa - mm - jj)</p>
<p><i>[Signature]</i> Signature of the Registered Owner or Authorized Representative Signature du propriétaire enregistré ou du représentant autorisé</p>		<p>2008 May 13 Date (yyyy - mm - dd) Date (aaaa - mm - jj)</p>



Transport
Canada

Transports
Canada

APPLICATION FOR A FLIGHT PERMIT

DEMANDE DE PERMIS DE VOL

INSTRUCTIONS

Print or type all entries. Reference *Canadian Aviation Regulations Standard 507* for the use and disposition of the form.

Dactylographier ou écrire en lettres moulées. Consultez Règlement de l'aviation canadien norme 507 du Manuel de navigabilité qui précise la façon de remplir et d'acheminer le présent formulaire.

A. AIRCRAFT IDENTIFICATION - IDENTIFICATION DE L'AÉRONEF

1. Owner - Propriétaire ALPINE HELICOPTERS LTD	3. Aircraft Manufacturer - Constructeur de l'aéronef BELL	4a. Model - Modèle 212
2. Address - Adresse 1295 Industrial Rd Kelowna, British Columbia Canada, V1Z 1G4	4b. Maximum Permissible Take-Off Weight Masse maximale admissible au décollage ► 5,080 Kg 11,200 lb	
	5. Serial Number - Numéro de série 30982	6. Nationality and Registration Marks Marques de nationalité et d'immatriculation C-FALK

B. PURPOSE OF FLIGHT PERMIT (Check applicable boxes) - OBJECTIF DU PERMIS DE VOL (Cocher la ou les case(s) voulue(s))

- ☐ Ferry flights to a base for repairs or maintenance
Un vol de convoyage vers une base en vue de réparation ou de maintenance
- ☐ Delivery, demonstration, market survey, or crew training flights
Un vol de livraison, de démonstration, d'étude de marché ou d'entraînement d'équipage
- ☒ Flights for the purpose of showing compliance with airworthiness standards
Un vol de démonstration de conformité aux normes de navigabilité
- ☐ Other purpose (Specify)
Autre fin (Préciser)

C. FLIGHT DESCRIPTION AND AIRCRAFT LIMITATIONS

Description of Flight(s) Use attachment when appropriate

DESCRIPTION DU VOL ET LIMITATIONS DE L'AÉRONEF

Description du ou des vol(s) Joindre une feuille au besoin

1. From - Aéroport de départ YYC - CALGARY, ALBERTA	2. To - Aéroport de destination YYC - CALGARY, ALBERTA	
3. Via - Escales NIL	4. Effective date (yyyy - mm - dd) Date effective (aaaa - mm - jj) 2008-05-14	5. Termination date (aaaa - mm - dd) Date limite (aaaa - mm - jj) 2008-08-14

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7. The following maintenance conditions are considered necessary for safe operation:

Les conditions d'entretien suivantes sont nécessaires pour la conduite des vols en toute sécurité :

LOG BOOK ENTRY BY QUALIFIED AME

8. The following operating conditions are considered necessary for safe operation:

Les conditions d'exploitation suivantes sont nécessaires pour la conduite des vols en toute sécurité :

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Signature, AME Licence No., ACA No. or RCA No.
Signature, N° de licence de TEA, N° d'autorisation ou N° d'autorisation restreinte
and - et

Date (yyyy - mm - dd)
Date (aaaa - mm - jj)

Signature of the Registered Owner or Authorized Representative
Signature du propriétaire enregistré ou du représentant autorisé

Date (yyyy - mm - dd)
Date (aaaa - mm - jj)



Transport Canada
Transports Canada

APPLICATION FOR A FLIGHT PERMIT

DEMANDE DE PERMIS DE VOL

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FLIGHT TEST PLAN TP798.02.**

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Signature, N° de licence de TEA, N° d'autorisation ou N° d'autorisation restreinte
and - et

[Signature]
Signature of the Registered Owner or Authorized Representative
Signature du propriétaire enregistré ou du représentant autorisé

2008 May 13
Date (yyyy - mm - dd)
Date (aaaa - mm - jj)

2008 May 13
Date (yyyy - mm - dd)
Date (aaaa - mm - jj)

704 (403) 250-8333

Barry Newman**From:** Richard Rathwell [richard@aerodesign.ca]**Sent:** May 13, 2008 8:23 AM**To:** 'Barry Newman'**Subject:** JOB 798 - Rappel Step - Flight Test

Barry,

For the rappel step flight test, we require the following;

- a. Reg. and s/n of the helicopter to be used, C-FALK ^{S/N} 30982
- b. Weight and CG of the helicopter, 6533.5 lbs 143.85 c/g + .19 lateral
- c. Date available for testing, 14 May 08
- d. The name and contact info of the local AME to sign off the installation, and Mike Levesne
- e. The name of the pilot, Mike Levesne (403) 815-5968


Thanks,

Richard

→ credit

13/05/2008

CONFORMITY INSPECTION RECORD

Applicant AERO Design Ltd.	Aeronautical Product Rappel Step Installation				Title of Change Rappel Step Installation
	Make Bell	Model 212	Serial No. 30982	Registration C-FALK	
Drawing No.	Applicant's Inspector Signature	Date	T.C. Inspection Signature	Date	Findings
79801		Mar 14/08			

APPLICANT'S ATTESTATION

I hereby confirm that the prototype installation for the subject

☒ MODIFICATION,

☐ REPAIR,

☐ TSO/AP-TC ARTICLE

is in conformity with the applicable installation drawing(s) listed above
and that necessary ground tests have been carried out.
[Please check (✓) the applicable box.]

Additional Information:

Signature:  ACT-30

TC INSPECTION

☐ ACCEPTABLE

☐ UNACCEPTABLE

Remarks:

Signature: _____

AIRWORTHINESS NOTICE B043 EDITION 2, dated 28 January 2000

CONFORMITY INSPECTION ASSOCIATED WITH APPLIANCE TYPE CERTIFICATION OR MODIFICATION/REPAIR APPROVAL PROJECTS

(This Airworthiness Notice supersedes AN No. B043 Edition 1, dated 24 April 1998.)

Purpose

The purpose of this notice is to explain the responsibilities of an applicant prior to requesting a conformity inspection associated with the prototype evaluation of a supplemental type certificate (STC), a limited supplemental type certificate (L/STC), a repair design certificate (RDC), a TSO and/or an appliance type certificate (AP-TC) installation. This revision is intended to clarify the qualifications for those persons responsible for the conformity inspections.

Background

In several cases, prototype installations have not been performed in accordance with the applicant's installation drawings nor have the necessary ground tests been conducted, where required, prior to seeking a conformity inspection by Transport Canada (TC). This situation may often result in ineffective use of TC resources.

Conformity Requirements (Prototype Installation)

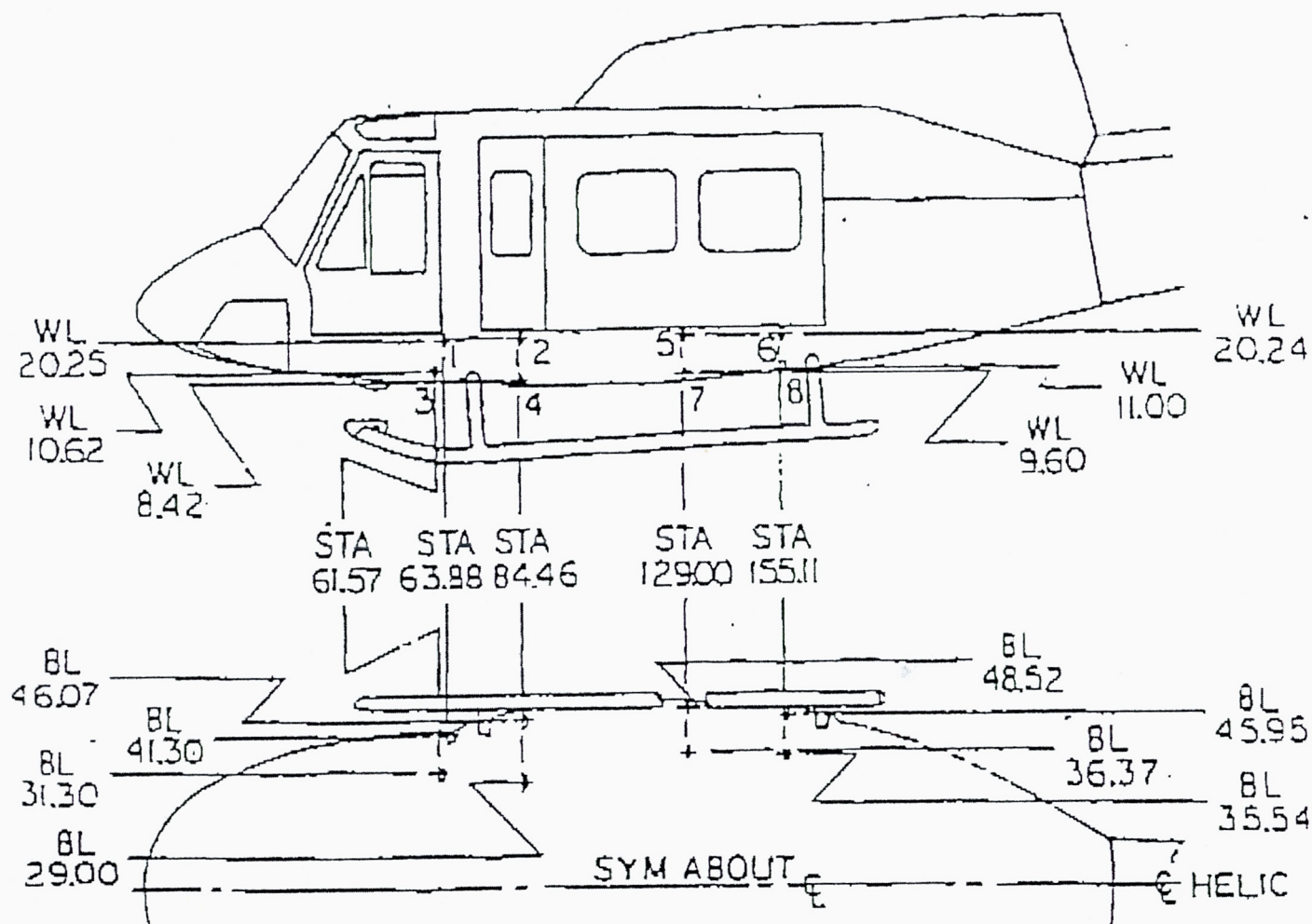
The need for a conformity inspection by Transport Canada on a prototype installation associated with an STC, L/STC, RDC, AP-TC or TSO design approval project will be determined by the regional engineer responsible for the project, and the applicant will be advised accordingly. Where such a requirement has been identified, the prototype installation is to be verified by the applicant or his designated person for conformity with the applicable installation drawings and, where required, ground tests performed to determine functionality. The above functions are to be carried out prior to the applicant requesting the required conformity inspection by TC representatives.

Confirmation

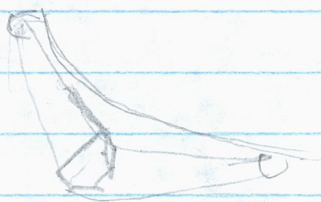
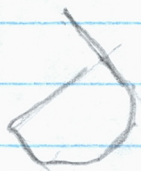
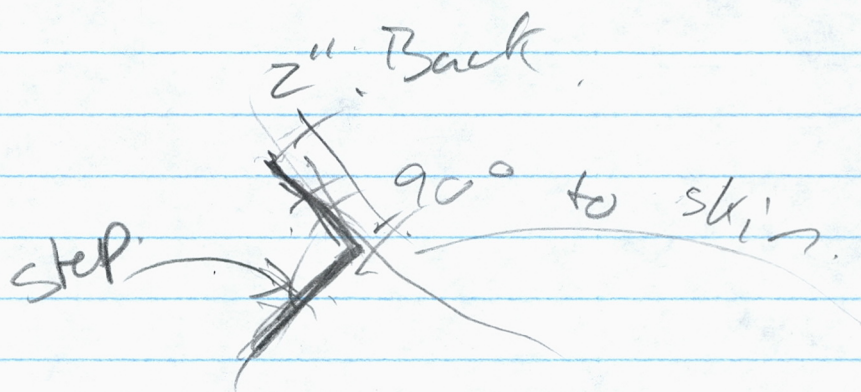
A written confirmation is to be provided to the responsible regional project engineer using the Conformity Inspection Record form appended to this notice, or an equivalent form acceptable to TC. The completed form is to be signed by an appropriately rated Aircraft Maintenance Engineer (AME) or Approved Maintenance Organization (AMO). TC form 24-0045 (Conformity Certificate - Repair or Modification), which is intended to certify the installation of an approved modification or repair, should not be used as a Conformity Inspection Record. The Conformity Inspection Record should be accompanied by details pertaining to the location of the test article, the proposed modification or repair, and a proposed date for accomplishing the conformity inspection by TC Airworthiness Inspectors.

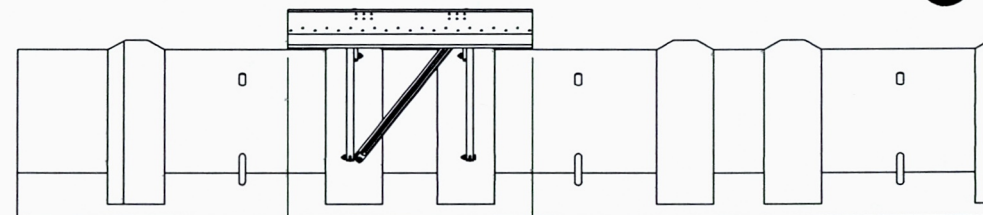
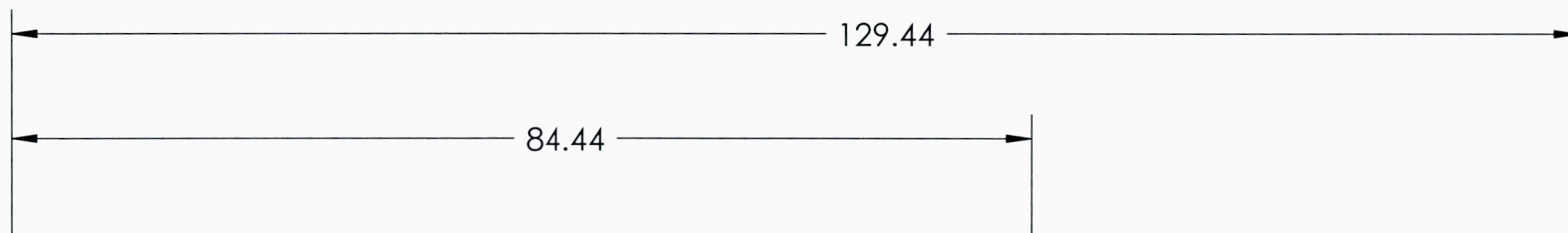
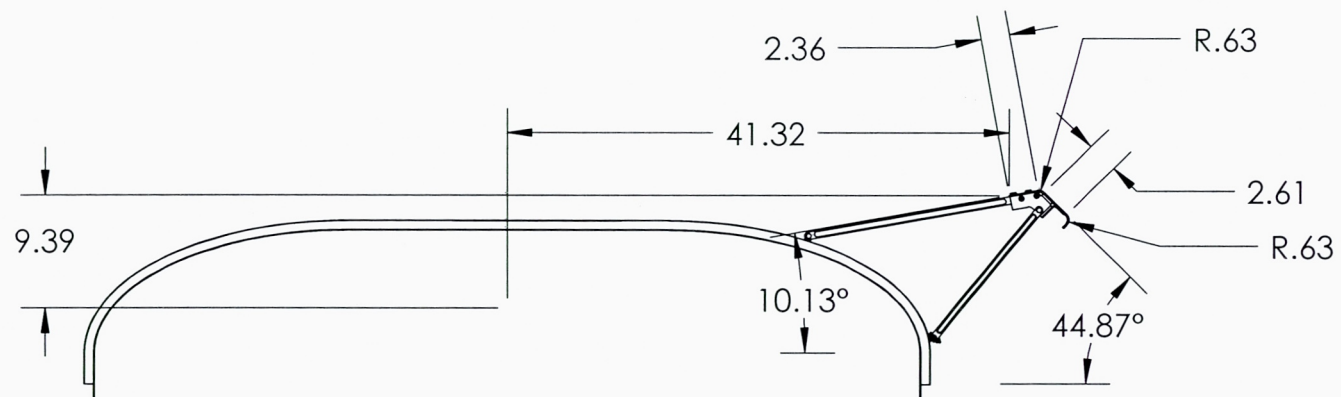
EXTERNAL HARDPOINTS: MODELS 205, 212, 214B & 412

FUSELAGE LOCATIONS AND ALLOWABLE ULTIMATE LOADS



CAUTION: Helicopter C.G. limits must be maintained for all equipment or stores configurations which attach to any or all of these hardpoints.





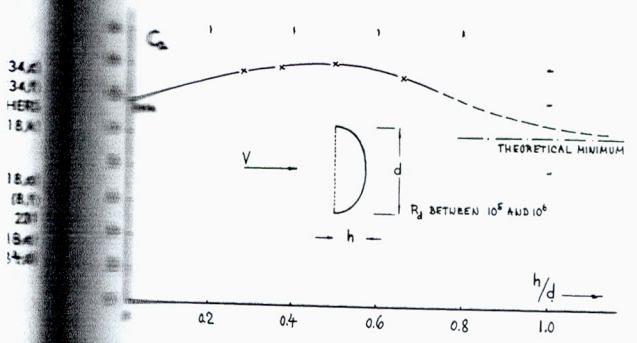


Fig. 31. Drag coefficient of sheet-metal "caps" (40,a) as a function of their height ratio.

and Cups. As large as the drag coefficients of spheres may be, there are other shapes exhibiting still higher values. Figure 31 shows the drag coefficient of open cup- or cap-like bodies (similar to parachute canopies). The maximum drag coefficient (on projected area) is obtained for h/d in the order of a shape which is \approx hemispherical. Upon further increasing the height ratio, the rear side more and more changes into a wake "fairing". The drag coefficient is, therefore, expected to approach the theoretical minimum which corresponds to full stagnation pressure across the opening.

Figure 32 (near). Drag coefficients of various 3-dimensional bodies (40) at R -numbers between 10^4 and 10^6 . Note: (•) tested on wind-tunnel floor.























7. DRAG OF WEDGES AND CONES

Figures 32 and 33 present shape and drag coefficient of a number of three- and two-dimensional bodies. All of these shapes have a more or less separated flow pattern; most of them have negative pressure on their rear side; and their drag coefficients are comparatively high.

Angle of Flow. To establish some order in the drag coefficients of various shapes, the geometrical angle is very useful, at which the flow is guided by the body's surface upon separating from its rear side. The flat plate, for example, has such an angle " ϵ " = 90° . A "fold" with a vertex angle of two times 45° , has a separation angle of 90° plus or minus 45° , depending upon the direction of the oncoming flow. Figure 34 demonstrates how the drag coefficient increases as a function of the shape angle. Two branches are found, of course; one for two-dimensional bodies (between walls) and another one for three-dimensional conditions. At " ϵ " = 0 , parallel-sided round-nosed shapes have been used in the graph; a hallow, scoop-like body is plotted at 180° .

Figure 33 (right). Drag coefficients (41) of 2-dimensional shapes (between walls) at R between 10^4 and 10^6 . Note: (+) in subcritical flow.

Information on rear-side pressure of plates:
On disks and small-aspect-ratio plates see: NACA (36, Ergebnisse IV; reference (40,f).
On plates between walls see: (12), (35,a) and (40,f).
Experimental results on three-dimensional bodies:
Bensch, Parachute Models, Lufo 1938 p.577.
NACA, Cup Anemometer, Tech Rpt 513 (1935).
NACA, Hemispherical Bodies, Ergebnisse IV (1932).
Eiffel, Recherches a Tour Eiffel, Paris 1907.
Hemispherical Cup at $R_d = 2 \cdot 10^5$, ARC RM 712 (1919).
Manger and Nokkented, Elementary Bodies and Windings, Copenhagen 1930 and 1936; Transl'n by Jarvis.
Sections (tested between plates or walls):
Lambert, Simple Shapes, NACA T. Rpt 619 (1940).
Bunkers Wind-Tunnel, Report Ströte V.9609 (1940).
Interference Between Struts, NACA T. Rpt 468 (1933).
Jelany-Sorensen, Various Shapes, NACA T. Note 3038.
Göttingen, Ergebnisse II (1923) and III (1926).
Bunkers Wind-Tunnel Result on Angle Profile.
Reported by Barth, Zt. Flugwissen 1954 p.309.
Free-streamline (cavitation) theory:
Kármán, Free Jet Theory, Crelle 1869 (see Lamb).
Lewy, Russian Phys.-Chem. Society 1881 (see Lamb).
Plesset-Schafer, Journal Appl. Physics 1948
and Review Modern Physics 1948 p.228.
Reichardt, Laws of Cavities, German ZWB UM 6628.
Neef, Dive Brakes, Fieseler Tunnel Rpt 22 (1941).

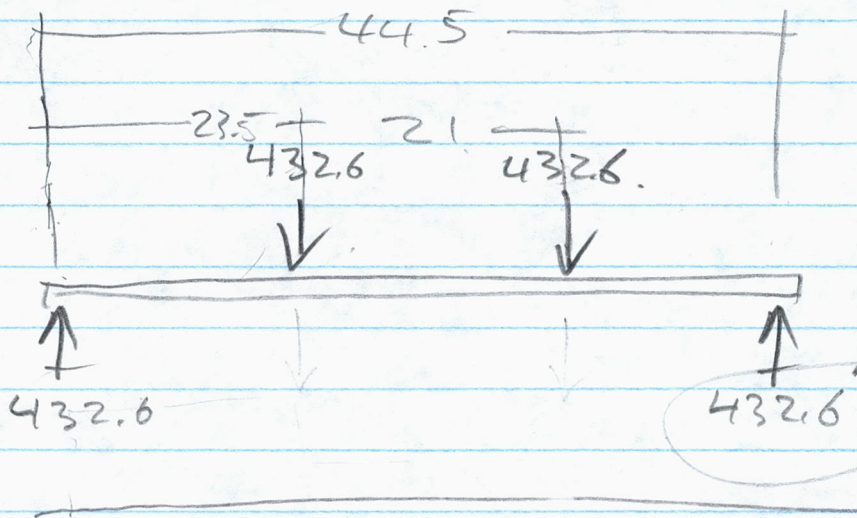
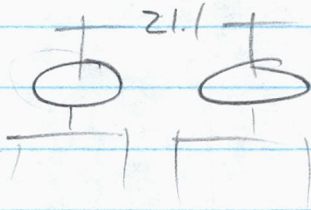
SHAPE	REF.	C_{D_0}	SHAPE	REF.	C_{D_0}
	STING SUPPORT	0.47 ₊		—	1.17 ₊
	(c)	0.38		(a)	1.20
	(c)	0.42		(g)	1.16
	(e)	0.59 ₊		(d)	1.60 ₊
	(f)	0.80 ₊		(e)	1.55
	(d)	0.50		(a)	1.55
	SEPARATION	1.17		VORTEX STREET	1.98
	(c)	1.17		(a)	2.00
	(b)	1.42		(a)	2.30
	(a)	1.38		(b)	2.20
	(f)	1.05 ₊		(a)	2.05 ₊

1629

Analysis for persons using the step to enter the 798 Eng. aircraft.

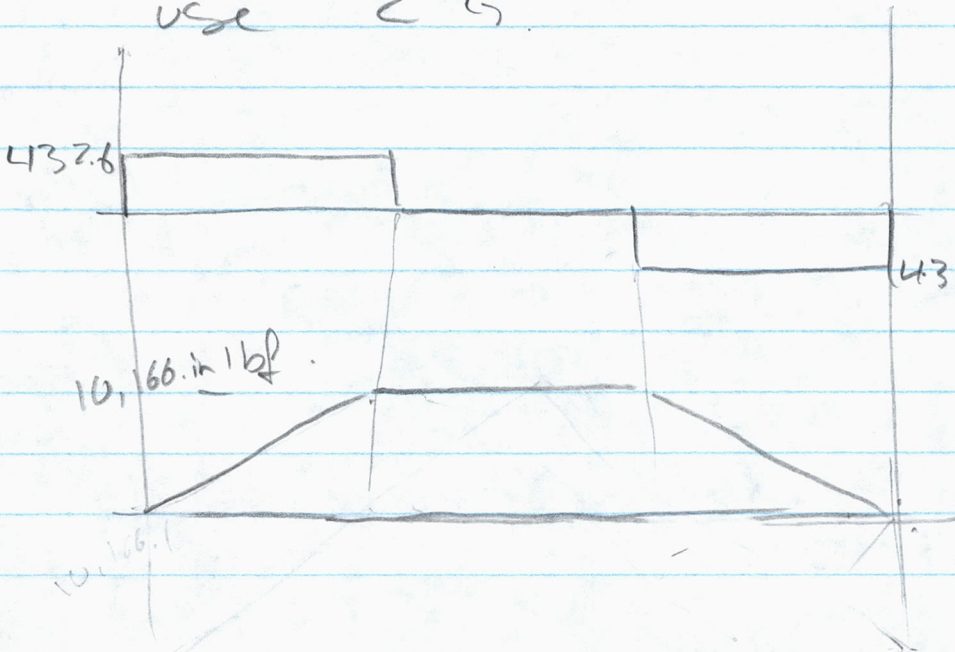
Bending

Assumption $2 \times 95^{\text{th}}$ percentile males.
wt. per person 216.3 lb.



$2 \times \text{AN4 Bolts}$
@ 3600 lb.
single shear.

No regulation for level use 2 G.



$$I_x = 0.63$$

$$c = 1.25$$

$$\frac{M}{I} = \frac{10,166.1 \times 1.25 \text{ in.}}{0.63 \text{ in.}^4}$$

$$= 20,170 \text{ psi}$$

$$6061-T3 > 20 \text{ ksi}$$

TO: RICHARD
FROM: MIKE @ ALPINE HELICOPTERS
1 PAGE TO FOLLOW.

05/13/2008 13:20 FAX 1 250 769 2040

ALPINE HELICOPTERS

001/002



Alpine
HELICOPTERS LTD.

1295 Industrial Road
Kelowna, British Columbia
Canada V1Z 1G4
Telephone: (250) 769-4111
Facsimile: (250) 769-2040

TO:

Richard

FROM:

Ben

DATE:

FAX NO.:

NO. OF PAGES TO FOLLOW:

1

Please forward ~~Weight~~ Station 7
Step for W+B amendments for logbook
entry.

Thanks
[Signature]

Long

Caf G.

	wt	str. (in)	Moment
step	6.9 lb	106.73	736.44
Fuel	1.6 lb	84.46	135.14
ABT	1.0 lb	129.00	129.00
	<u>9.5 lb</u>		<u>999.58 / 9.5 lb</u>

$$\text{Str. CG} = 105.22 \text{ in}$$

	wt.	BL (in)	Moment
step	6.9 lb	46.06	317.814
Fuel	1.6 lb	41.82	66.912
ABT	1.0 lb	44.47	44.47
	<u>9.5 lb</u>		<u>429.20 / 9.5 lb</u>

$$\text{BL CG} = 45.18 \text{ in}$$

$$37.012$$

$$473.46$$

$$87.74$$

$$84 - \text{BL } 46.07$$

$$129 \text{ BL } 48.52$$

$$3.28$$

$$6.03$$

digital scale.

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- [Proactive disclosure](#)

Employee Directory

Employee Information

Name: David McNab
Phone: (403) 292-5008
Position: Superintendent, Maintenance and Manufacturing
X400: c=CA;a=GOVMT.CANADA;p=GC+TC;s=McNab;g=David;
Internet: mcnabd@tc.gc.ca
Routing Symbol: RACH
Building: Calgary, Airport Corporate Centre
Address: 800-1601 Airport Road N-E
City: Calgary
Province: Alberta
Postal Code: T2E 6Z8

Organization Information

Organization: Aircraft Maintenance and Manufacturing - Calgary
Address: Calgary, Airport Corporate Centre 800-1601 Airport Road N-E
City: Calgary
Province: Alberta
Postal Code: T2E 6Z8
Fax: (403) 292-6709

[Organizational Structure](#)

